IN THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) A system comprising:

an implantable medical device, the implantable medical device comprising:

at least one electrical input, to receive sensed electrical activity of a heart;

a sampler circuit, coupled to the at least one electrical input, operable to generate sampled values of the sensed electrical activity;

a clock circuit, the clock circuit operable to generate readable values representative of absolute time, wherein the clock circuit and the readable values roll over every few minutes;

a memory, including an event marker buffer; and

a controller circuit, coupled to the sampler circuit, the clock circuit, and the memory, the controller circuit operable to process the sampled values to generate at least one marker to indicate a detected event related to the sensed electrical activity, and wherein the controller circuit is operable to read a clock circuit value as a timestamp representative of absolute time, the timestamp indicating when the detected event occurred within a window of absolute time that rolls over every few minutes, and the controller circuit also operable to store the at least one marker with the timestamp in the event marker buffer of the memory.

2. (Original) The system of claim 1, wherein the controller circuit generates a plurality of markers, and wherein each event marker is stored in the event marker buffer as a data structure, the data structure comprising a variable number of event marker entries, wherein the entries include:

an event marker code;

the timestamp of an absolute time when the event occurred; and

additional data, if indicated by the event marker code, wherein the type and amount of additional data is defined by the event marker code.

3. (Original) The system of claim 1, wherein the system further includes an external device to communicate with the implantable medical device, and wherein the implantable medical device further includes a telemetry circuit to transmit the at least one event marker to the external device.

4. (Original) The system of claim 3, wherein the at least one electrical input includes a plurality of electrical inputs coupled to the sampler circuit, each input corresponding to a signal channel, and wherein the memory includes at least one channel buffer to store sampled values, sampled values are stored in the at least one channel buffer as a data structure, the data structure having entries, the entries including:

a signal channel identifier;

a timestamp of absolute time when sampling of an electrical input began; and

a variable number of sampled values.

5. (Original) The system of claim 4, wherein the telemetry circuit transmits the sampled values and event markers in a plurality of time slots, including a first set of time slots to transmit a variable amount of event markers from the event marker buffer and a second set of time slots to transmit a variable amount of sampled values from a variable number of channel buffers.

6. (Original) The system of claim 4, wherein the electrical inputs are coupled to a plurality of electrodes, the electrodes placed at different locations of a heart to sense electrical activity of a heart.

7. (Original) The system of claim 6, wherein at least one electrical input is coupled to a sensor, wherein the sensor generates electrical signals related to a physiologic parameter of a patient.

8. (Original) The system of claim 3, wherein the external device includes:

a buffer to receive the sampled values, markers and timestamps;

a processor operable to reconstruct a representation of the signals sensed on the electrodes and of the activity events using the timestamps; and

a display operable to display the reconstructed representation of the signals.

9. (Original) The system of claim 8, wherein the implantable device is operable to transmit the sampled values and the detected event markers as they are accumulated in substantially real time, and wherein an amount of sampled values and markers are stored in the memory buffers.

10. (Original) The system of claim 9, wherein the amount of sampled values and markers are stored in the memory buffers memory buffers store is an amount that occurred during about a one hundred milliseconds (100ms) buffer time window.

11. (Original) The system of claim 8, wherein the controller stores the sampled values generated from the channels in association with a timestamp as compressed data, and wherein the processor of the external device is operable to decompress the data.

12. (Original) The system of claim 11, wherein the controller is operable to perform amplitude compression to compress the data.

13. (Original) The system of claim 11, wherein the controller is operable to reduce the sampling rate to compress the data.

14. (Original) The system of claim 11, wherein the controller is operable to perform Huffman encoding to compress the data.

15. (Original) The system of claim 3, wherein the external device is operable to communicate with a global computer network.

16. (Original) The system of claim 1, wherein the implantable medical device includes an implantable cardioverter defibrillator.

17. (Original) The system of claim 1, wherein the implantable medical device is a cardiac rhythm management device.

18. (Currently Amended) A method comprising:

sensing electrical activity of a heart using an implantable device;

detecting events associated with the electrical activity;

storing event markers representing the events in a memory, each event marker including a timestamp of when a corresponding event occurred, the timestamp representative of an absolute time referenced within a window of time that rolls over every few minutes; and

transmitting the event markers to an external device.

19. (Original) The method of claim 18, wherein the sensing electrical activity includes:

sensing electrical activity at a plurality of locations of a heart;

converting the electrical activity into data suitable for storage in the memory; and

storing the data in one or more buffers in the memory, including allocating a buffer for each location of the sensing, and including storing a timestamp in each buffer indicating an absolute time related to when the electrical activity of the data was sensed, and wherein the method further includes transmitting the data and timestamps corresponding to the data to the external device.

20. (Original) The method of claim 19, wherein the transmitting the data and the transmitting the event markers to an external device includes transmitting data and event markers in a plurality of time slots, including a first set of a variable number of time slots to transmit a variable amount of event markers and corresponding timestamps, and a second set of a variable number of time slots to transmit a variable amount of the data and corresponding timestamps.

21. (Original) The method of claim 20, wherein the transmitting the data and the transmitting the event markers includes transmitting an identifier to identify a sensing location associated with the data.

22. (Original) The method of claim 20, wherein transmitting the data, timestamps and event markers to an external device includes:

buffering the data in the external device;

aligning the data and the event markers in accordance with absolute time using the timestamps; and

displaying the data from the plurality of locations and the event markers according to their timing relationship with respect to the absolute time.

23. (Original) The method of claim 22, wherein displaying the data includes displaying a baseline value when the data contains gaps because a communication link is lost.

24. (Original) The method of claim 19, wherein converting the electrical activity into data includes converting the electrical activity into compressed data using a compression algorithm.

25. (Original) The method of claim 19, wherein converting the electrical activity into compressed data using a compression algorithm includes using amplitude compression.

26. (Original) The method of claim 19, wherein converting the electrical activity into compressed data using a compression algorithm includes using Huffman encoding.

27. (Original) The method of claim 19, wherein converting the electrical activity into compressed data using a compression algorithm includes reducing the sampling rate to compress the data.

28. (Original) The method of claim 18, wherein sensing the electrical activity and converting the sensed activity into data includes sensing and converting in substantially real time, and wherein storing in memory includes buffering data and event markers for transmission to an external device in substantially real time.

29. (Original) The method of claim 28, wherein the timestamp includes an indication of absolute time measured within a two-minute window.

30. (Original) The method of claim 18, wherein storing in memory includes storing data and event markers for later retrieval by the external device.

31. (Original) The method of claim 30, wherein the timestamp includes an indication of absolute time measured from a system epoch.

32. (New) The system of claim 1, wherein the timestamp representative of absolute time is referenced within a time window of approximately two minutes.